

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
23 December 2004 (23.12.2004)

PCT

(10) International Publication Number  
**WO 2004/110971 A2**

- (51) International Patent Classification<sup>7</sup>: **C07C 49/00**
- (21) International Application Number: **PCT/JP2004/007210**
- (22) International Filing Date: **20 May 2004 (20.05.2004)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:  
**2003-165200 10 June 2003 (10.06.2003) JP**
- (71) Applicant (for all designated States except US): **SHOWA DENKO K.K.** [JP/JP]; 13-9, Shibadaimon 1-chome, Minato-ku, Tokyo, 1058518 (JP).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **SAITO, Makoto** [JP/JP]; c/o KAWASAKI PLANT, SHOWA DENKO K.K., 2-3, Chidori-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 2100865 (JP). **UEDA, Takashi** [JP/JP]; c/o KAWASAKI PLANT, SHOWA DENKO K.K., 2-3, Chidori-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 2100865 (JP). **TANI, Takashi** [JP/JP]; c/o KAWASAKI PLANT, SHOWA DENKO K.K., 2-3, Chidori-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 2100865 (JP). **NAKAMURA, Keiichi** [JP/JP]; c/o KAWASAKI PLANT, SHOWA DENKO K.K., 2-3, Chidori-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa, 2100865 (JP).
- (54) Agent: **SUZUKI, Shunichiro; S.SUZUKI & ASSOCIATES**, Gotanda Yamazaki Bldg. 6F, 13-6, Nishigotanda 7-chome, Shinagawa-ku, Tokyo, 1410031 (JP).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): **ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**

**Published:**

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **PROCESSES FOR PREPARING  $\beta$ -DIKETONE COMPOUND, METAL COMPLEX THEREOF AND METALLIC COMPOUND**

(57) Abstract: Disclosed is a process for preparing a  $\beta$ -diketone compound such as 2,6-dimethyl-3,5-heptanedione, which comprises reacting an ester compound such as an alkyl isobutyrate with a ketone compound such as 3-methylbutanone in the presence of an alkali metal alkoxide as a catalyst. The process comprises a step 1 in which an ester compound  $CR^1R^2R^3COOQ$  is reacted with a ketone compound  $CR^4R^5R^6COCH_2R^7$  using an alkali metal alkoxide catalyst to give a  $\beta$ -diketone compound  $CR^1R^2R^3COCHR^4R^5R^6$ . (In the formulae,  $R^7$  is hydrogen or an alkyl group of 1 to 4 carbon atoms while others are each independently hydrogen or an alkyl group of 1 to 3 carbon atoms, and at least one of  $R^1$  to  $R^6$  is hydrogen.)

WO 2004/110971 A2